# Domain structure of NiFe/Au/Co/Au multilayers with perpendicular anisotropy

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The magnetic properties of sputtered $[Ni_{80}Fe_{20}(2\,nm)/Au(t_{Au})/Co(t_{Co})/Au(t_{Au})]_{15}$ multilayers with $t_{Au}$=1.5-3 nm and $t_{Co}$=0.6-1.5 nm were investigated with magnetic force microscopy. The NiFe layers possessed in-plane anisotropy while the sandwiching of Co layers between Au layers ensured their perpendicular anisotropy through the influence of a surface anisotropy. It led to the formation of maze configuration of stripe domains. The stripe domains period $\lambda$ strongly depends on $t_{Co}$ changing from 0.9 to 0.3 $\mu m$ when $t_{Co}$ changes from 0.6 to 0.8 nm. $\lambda$ increases with the Au layers thicknesse, too. Both dependencies can be qualitatively understood by the model of Draaisma and de Jonge [1]. It describes however, a multilayer with all sublayers possessing perpendicular anisotropy in contrast to our case. Therefore the exact estimate of the effective magnetic anisotropy with the above model is not possible. The values of stray fields acting on Py layers, in the range of 100 kA/m, estimated from magnetoresistive dependencies are in qualitative agreement with those evaluated from the model of infinitely long stripe domains with domain widths taken from magnetic force microscopy measurements.

[1] H. J. G. Draaisma and W.J.M de Jonge, J. Appl. Phys. **62**, (1987) 3318

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